



Justice Information Network Proof of Concept Stolen Vehicle Recovery & Criminal Investigation

Developed by **I N T E R L I N K**

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1 Executive Summary

The State of Washington Integrated Justice Information Board (The Board), through the Justice Information Network (JIN) initiative, has a stated goal of “total sharing of data from computer systems servicing the justice community”. This proof of concept (POC) effort is undertaken to educate the JIN community on the use and capabilities of Enterprise Application Integration (EAI). An important part of this initiative is the selection of the integration technology platform. As a part of this effort, Microsoft BizTalk Server 2004, Visual Studio .NET, Windows Server 2003 have been selected to provide the infrastructure for integration in the POC. While a specific business problem has been identified by the steering committee, the business issue is there only to provide context for demonstrating the capabilities and value of the underlying architecture and components. To this point, the primary objectives of this initiative are:

- 1- Develop a sample application that would demonstrate the capabilities of BizTalk Server and web services technologies. The scope of the effort will be representative of real-life integration scenarios and data sources.
- 2- Educate participants on integration and implementation models that can be utilized when dealing with EAI and web services technologies.
- 3- Discover aspects and features of EAI and web service technologies that can be leveraged or avoided during subsequent design phases.



2 About Interlink Group, LLC

Interlink Group, LLC is an award-winning IT professional services firm with a proven business model focused on built-to-order software products and network infrastructures. Founded in 1989, Interlink is headquartered in Denver, Colorado and has a strong track record of serving clients locally, as well as throughout the nation. We have established regional offices in Bellevue (WA), Portland (OR), Sacramento (CA), and San Francisco (CA). As a trusted advisor to our clients, Interlink helps them manage their portfolio of technology investments to drive an exceptional business return. We deliver tangible results as a result of being savvy in the business of technology, and being thought leaders in delivering integrated innovation across the entire Microsoft platform. Based upon our proven experience in serving the needs of our clients, we have developed an innovative Enterprise Services Model (ESM) comprised of the following core areas:

- Strategic Innovation - Aligning business and technology objectives to adapt to the changing needs of the business;
- Optimized Platforms - Developing extensible infrastructure and achieving operational excellence while reducing costs;
- Connected Processes - Building and integrating adaptive processes that span customers, partners and employees; and
- Integrated Information - Connecting your people, information and collaborative workflow to improve individual, team and organizational productivity.



Our services model also enables us to partner with our clients for the life of their IT investment, from initial concept through on-going maintenance over time. We do this by providing a breadth of services including initial critical thinking processes, disciplined project delivery methodologies, and an ability to provide 24x7x365 managed services as part of our Global Services Center.

3 Solution Description

The POC seeks to integrate three separate jurisdictions: Washington State Patrol (WSP) ACCESS, Pierce County's Law Enforcement Support Agency (LESA), and King County Police Chiefs Association (KPCPA) Regional Automated Information Network (RAIN).

The POC application will perform the following core tasks:

- 1- Smart Search for vehicle record
 - a. The RAIN application will present the user with a vehicle "Search" screen. User will be able to search for vehicles by one or more criteria that are supported by the ACCESS system. A test record will be used to ensure no sample data can be queried by RAIN authenticated users. A demo user identification and password will be created in RAIN to control access to the application.
 - b. The query will be provided to ACCESS and LESA through web services and Microsoft BizTalk architecture translating the request to the appropriate format for each system.
 - c. Results will be returned from ACCESS and LESA to RAIN translated to a format required by the requesting system and presented to the user with the matching vehicles and detailed information.
- 2- Vehicle record status update
 - a. The application will allow the demo user in LESA to complete an incident report on a stolen vehicle recovery. The incident report will be submitted – as is currently – to the LESA records management system.



- b. Using automated workflow features, the LESA records management system will call a web service located on the Microsoft BizTalk platform. The record update will be sent to ACCESS. Based on existing business logic, ACCESS will accept or reject the change.
- c. If the update is accepted, the application will then send a confirmation to the demo user that the record has been modified.

4 Integration Technologies

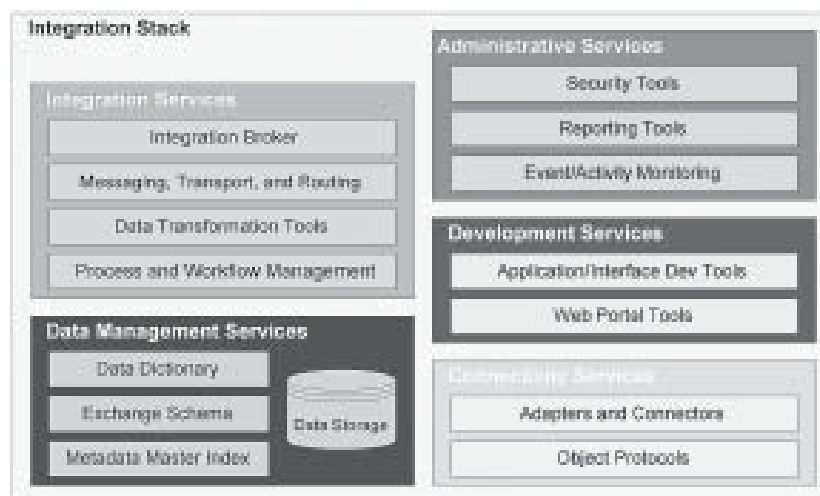
4.1 Technical Components and Architecture

Our proof-of-concept will implement a solution using our Enterprise Architecture Integration Platform (EAIP) based on Microsoft BizTalk Server, with an accompanying framework and tools, to allow the State of Washington to meet its requirements. Given that the State of Washington's integration needs will inevitably change over time as new applications are added or agencies are integrated, we believe that your integration environment needs to be flexible and dynamic, so we do not believe a point-to-point "off the shelf" solution would be appropriate, nor cost-effective for the State of Washington in the medium to long term. Today, the State of Washington may only need to link a few systems or agencies together and pass simple information back and forth. However, in the future, the State of Washington will need to link many systems and eventually may need to extract information from disparate systems to a data store for comprehensive data mining and global sharing.

The proof-of-concept is based on BizTalk Server 2004, which is Microsoft's highly acclaimed platform for application integration, process automation and trading partner interchange. BizTalk Server 2004 is Microsoft's 3rd release of the product – initially launched in 2000. BizTalk Server is designed around a messaging paradigm in which the messages and documents, as well as, the processing components that interact with the messages and documents, are based on XML and Web Services technologies.

4.2 Components

For the integrated Justice Information Network, it is important to establish a comprehensive framework that is designed to link information between the State of Washington's existing applications and to provide similar connectivity and information sharing with other partner agencies, both internal and external to the state government. The following figure depicts the various components that comprise the integration solution.



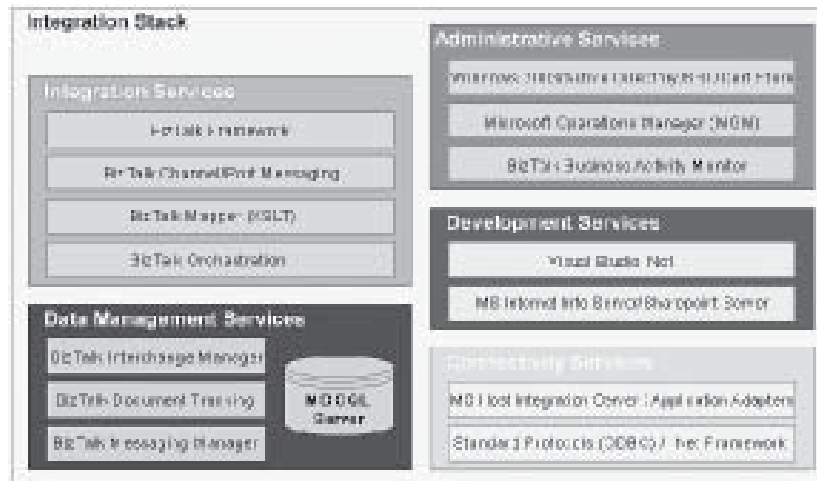


The integration solution will be built upon an infrastructure suite of Microsoft enterprise servers that includes the following components and functions:

- **Microsoft BizTalk Server:** Microsoft BizTalk Server will act as the hub of the integration solution framework and is responsible for orchestrating processes, services and connection adapters that form the Integration Solution framework. It is responsible for managing messaging requests between heterogeneous applications and orchestrating the timing, rules, and connectivity to legacy and other layers of the Integration Solution stack. BizTalk Server satisfies the requirements of the Integration Services layer.
- **Microsoft SQL Server:** Responsible for the back-end data support structure for Microsoft BizTalk Server and will be leveraged to contain application data in support of the front-end user interface and the meta-data services that the application framework requires. Microsoft SQL Server satisfies the requirements of the Data Management Services layer.
- **Microsoft Operations Manager (MOM):** Responsible for proactively managing events issued by Windows servers and application alerts/events. MOM will be configured to support both system and application level notifications. It satisfies the requirements of the Reporting Tools and Event/Activity Monitoring components of the Administrative Services layer.
- **Microsoft Host Integration Server:** Responsible for the connectivity layer to legacy host applications. It is a key component to meeting the Connectivity Services layer requirements. While this component is not being used in the proof-of-concept, we anticipate that a Microsoft-based integration solution for the Justice Information Network will eventually necessitate this technology.
- **Microsoft Internet Information Server (IIS):** Responsible for managing both external and internal web user interfaces to the business data. IIS supports both the Development Services layer and Integration Services (external web services messaging).
- **Windows 2003 - .NET 1.1 Framework:** Operating system and common object libraries in support of .Net application development and systems level interface. These components combine to support the Development Services framework, Administrative Services security, and operating system.
- **Visual Studio .NET:** Provides robust development tools for rapid development of custom EAI solutions requiring web services or other distributed processing/transaction protocols. Visual Studio .NET allows developers to build customized, service-based architecture components, using any combination of C#, VB, Jscript, and C++, and to expose those components to the enterprise. This supports the Development Services framework.



The following figure depicts the tools that satisfy the various integration layers.



4.3 Functional Capabilities

BizTalk Server functions as a multi-transport messaging and transformation broker that embodies the integration capabilities of XML technologies. The core integration mechanism is the use of a semantic model, based on XML schema, to represent the meaning and structure of information received from or forwarded to an application. A mapping tool based on XSLT is used to convert schema formats. An interchange takes place when the broker receives and identifies a specific document type that the platform recognizes as being the input to another application. The broker executes the format conversion through an orchestration transformation step and forwards the converted document to the receiving application.

4.3.1 Exchange Methods

BizTalk allows multiple methods to Query, Publish and Subscribe, as well as, Push and Pull information as required to or from any data source. Its primary method of accomplishing this is through an Adapter (or Application Interface Connector (AIC)). This is a tightly coupled connector that natively hooks into an existing application, database or operating system. In essence, you can either purchase or create an AIC applicable to any given system which then exposes the underlying data to BizTalk in its native XML format.

BizTalk Adapters provide the key to enhanced interoperability with a wide variety of applications and technologies. Microsoft, along with a number of adapter development partners and application vendor partners, has built an impressive catalog of adapters that serve to reduce the effort required to integrate business processes.

A secondary method of integration is through XML Web Services. These web services expose any existing data and the underlying processes or business logic via a standard interface accessible via common protocols, such as HTTP. Additionally, BizTalk can utilize messaging protocols and queues to both send and receive XML messages. There are several common messaging standards that are currently supported such as MSMQ, MQ Series, SMTP, etc. Yet another method of integration is direct database connections. You can easily connect directly to any SQL or Oracle database as well as any ODBC or OLE/DB compliant database.



5 Proof of Concept Process Definitions

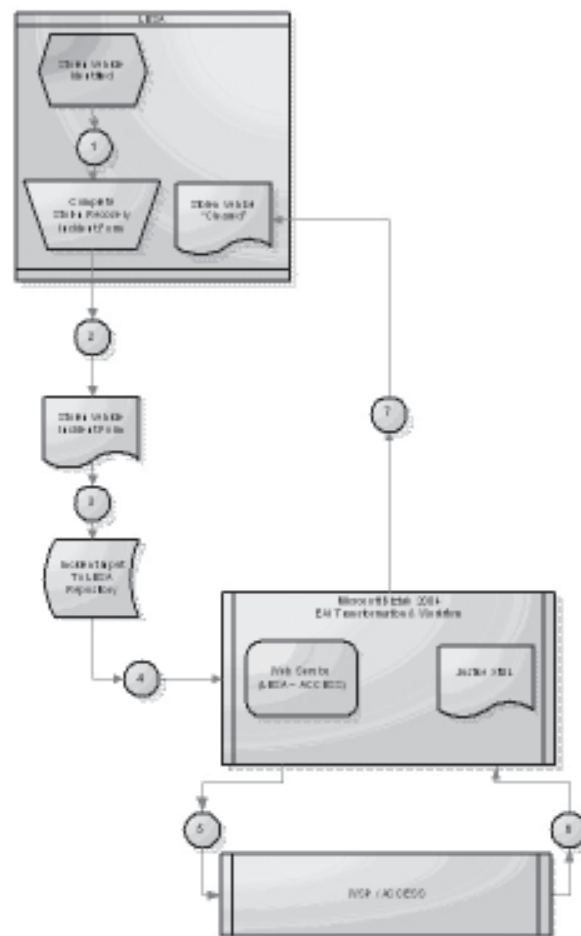
The POC will mock up a current law enforcement scenario focused on stolen vehicle recovery and criminal investigation.

The primary characteristics of the scenario are:

1. Automate the process of updating a stolen vehicle record, as “recovered,” in WSP ACCESS, directly from the incident form created by the arresting officer, once it is submitted to its local law enforcement agency’s record management system.
2. Provide the ability for RAIN criminal investigators to simultaneously search stolen vehicle information in ACCESS and related incident(s) information from the originating agency (e.g. LESA).
3. Provide the ability for RAIN criminal investigators to access the relevant incidents in LESA that are tied to the stolen vehicle.
4. Facilitate the rendition of external law enforcement agency records in the native user interface of an agency’s own systems.

5.1.1 LESA to WSP ACCESS Stolen Vehicle Record Update Process

The following diagram depicts the integration scenario for the stolen vehicle update process:



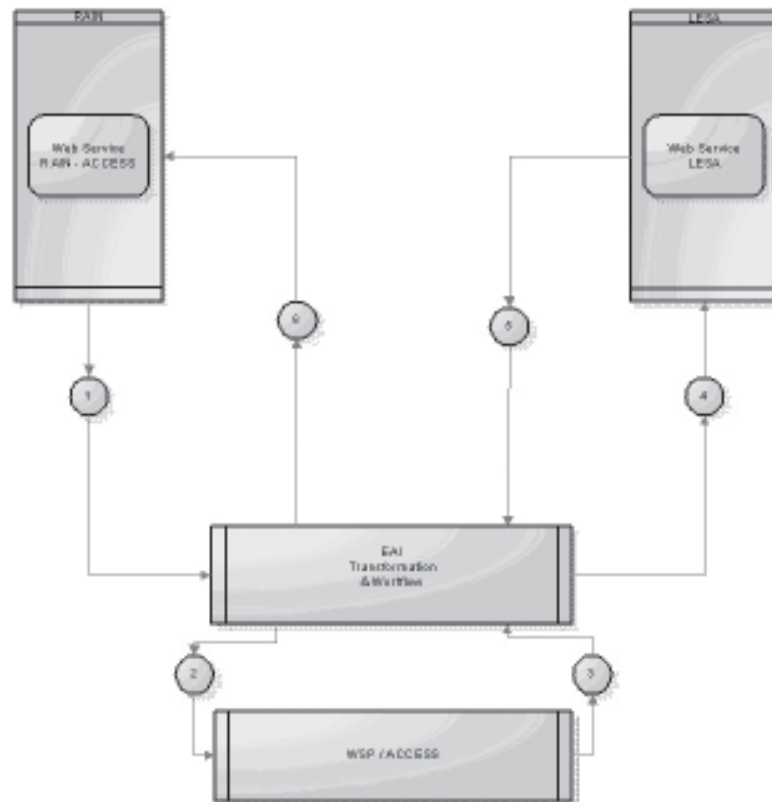


5.1.1.1 Process Definition

- 1- A stolen vehicle is identified by a Pierce County police officer.
- 2- The officer completes an incident form detailed the stolen recovery.
- 3- The incident form is uploaded to the LESA records management system.
- 4- Based on the State and vehicle license number (required to mark a stolen vehicle “cleared”), a trigger in the LESA records management system calls a web service (from the EAI layer) to update ACCESS records as “CLEARED.”
- 5- The EAI layer connects to ACCESS and updates the vehicle as “CLEARED.”
- 6- ACCESS acknowledges record update back to the EAI layer.
- 7- The EAI layer initiates the web service providing a receipt of the transaction. A receipt citing the vehicle as “CLEARED” is posted to a LESA website.

5.1.2 RAIN to ACCESS/LESA Stolen Vehicle Information Request Process

The following diagram depicts the integration scenario for the stolen vehicle information request process:



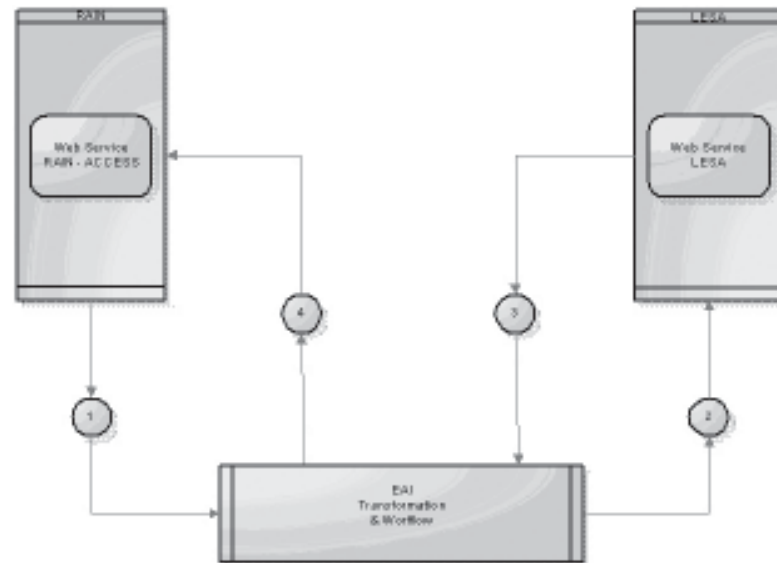
5.1.2.1 Process Definition

- 1- A King County Sheriff's Detective initiates a search for a vehicle license number that is associated with a current criminal investigation.
- 2- The EAI layer queries ACCESS providing the State and vehicle license number.
- 3- ACCESS responds that the vehicle has been stolen, but has been “cleared” as reported by LESA.
- 4- The EAI layer calls on LESA to locate any incidents that on record that contain the vehicle license number,
- 5- LESA returns a set of incidents associated with the vehicle license number.
- 6- The EAI layer returns ACCESS and LESA information to the King County Sheriff's Detective.



5.1.3 RAIN to LESA Stolen Vehicle Incident Request Process

The following diagram depicts the integration scenario for the stolen vehicle incident request process:



5.1.3.1 Process Definition

- 1- The King County Sheriff's Detective has received information that the vehicle was once stolen, has been recovered by LESA, and is associated with several incidents on record at LESA. The Detective chooses to inquire further on the detailed of one of the incidents associated with the stolen vehicle.
- 2- The EAI layer calls on the LESA web service to return the selected detailed incident report.
- 3- LESA returns the incident report.
- 4- The EAI layer provides RAIN with the detailed incident report.

6 Schedule for JIN Education Roundtables

In addition to the proof of concept, Interlink also organized a series of educational sessions for the JIN community. These sessions were designed to help the state develop a technical and operational vision for integration.

6.1 Technology Strategy & Project Implementation

Speaker: Alain Dias, Director of Strategic Services (Interlink Group Inc.)

March 19, 2004 1-3pm (Olympia)

How do we mold technology to our organizational processes and target areas of efficiency for information sharing? We will discuss critical thinking methods to identify, define, and prioritize technology projects aligned with an organization's mission and operating plans.

6.2 JIN Program Definition & Organization

Speaker: Alain Dias

April 2, 2004 1-3pm (Olympia)

What is the practical role for JIN in facilitating information sharing across Washington? We will discuss different program models that should be evaluated in the long-term organizational development of the Justice Information Network. Additionally, we will address the technology capabilities that JIN must possess to be an effective partner in integrated justice.



6.3 Integration Architectural Models, Security, and Implications

Speaker: Koray Ozcubukcu, Managing Consultant (Interlink Group Inc.)

April 9, 2004 1-3pm (Olympia)

How different architectural models affect performance, availability, scalability and other system qualities. We will discuss design principles and major tradeoffs as well as different integration platforms (Microsoft .NET and J2EE). What is the important security considerations related with integration architecture? We will discuss security at several layers.

6.4 XML Structures and Standards

Speakers: Burley Kawasaki, Chief Technology Officer (Interlink Group, Inc.)

Jeff Langford, Technical Specialist, Justice & Public Safety (Microsoft Corporation)

April 16, 2004 1-3pm (Olympia)

What is XML and how can it support information sharing within the State of Washington? What standards exist to facilitate information sharing using XML? We will discuss different methods to standardize data integration (Justice XML, King County XML, etc...) in a cost effective manner.

6.5 Service Bus vs. Hub & Spoke Architectures

Speaker: Burley Kawasaki

April 23, 2004 1-3pm (Olympia)

What is a service-oriented architecture? What are service buses? What is a hub & spoke architecture? We will discuss the role of middleware to facilitate messaging, translation, communication, and process integration. We will focus on the use of middleware to support JIN objectives based on real-world examples at both public and private organizations.

6.6 Business Process & Transactional Integrity in Integration

Speaker: Koray Ozcubukcu

April 30, 2004 1-3pm (Olympia)

How should we architect integration solutions for guaranteed delivery? We will discuss best design practices. The highest level of efficiency is achieved through process integration. We will cover concepts such as long-running transactions and human-to-machine process automation.

7 Success Factors

Project team has identified the following success criteria for this project:

- 1- *Prove out that the integration tools used (Microsoft BizTalk Server) are capable of handling the complex integration requirements of the State of Washington Justice Information Network.* The project team will demonstrate the capabilities of these tools by leveraging them in a small scale proof of concept project, which is representative of the bigger integration challenge. The resulting application must provide the full capabilities defined in the scope of work in a timely manner.
- 2- *Educate stakeholders of the State of Washington Justice Information Network on the important aspects of different integration models and the applicability of the tools used under each model.* The project team will hold several round-table discussions / brownbag sessions that will cover the following topics: XML structures and standards, integration models, J2EE versus Microsoft .NET, service bus versus hub and spoke architectures, technology planning and project implementation, Justice Information Network Program Definition and Organization. At the end of these sessions, participants should not have any open or unanswered questions about integration in general and the specific tools (Microsoft BizTalk Server) that are being leveraged as part of this proof of concept.
- 3- *Introduce a sample application demonstrating the value of integration while creating excitement and momentum.* The function of the resulting application must be easily understandable by the intended audience. It must help people to realize the potential opportunities and the value derived from integrating processes and systems across the JIN environment. It must demo well, in order to be used to promote the integration within and across the county agencies. It should serve as an educational model for projects involving the vertical integration of information flows from state to county agencies.



8 Schedule Milestone

The project schedule and associated milestones are described below:

| ID | Task Name | Start | End | Duration | Mar 2004 | | | | Apr 2004 | | | |
|----|-------------------|-----------|-----------|----------|----------|--|--|--|----------|--|--|--|
| | | | | | 3/7 | | | | 4/4 | | | |
| 1 | Envisioning Phase | 3/1/2004 | 3/12/2004 | 10d | | | | | | | | |
| 2 | Planning Phase | 3/15/2004 | 3/26/2004 | 10d | | | | | | | | |
| 3 | Developing Phase | 3/26/2004 | 4/14/2004 | 14d | | | | | | | | |
| 4 | Stabilizing Phase | 4/15/2004 | 4/19/2004 | 3d | | | | | | | | |
| 5 | Deploying Phase | 4/20/2004 | 4/21/2004 | 2d | | | | | | | | |

3/12/03 – Project Charter and Schedule Approval
 3/26/04 – Technical Requirements and Design Complete
 4/14/04 – Development Complete
 4/19/04 – Testing Complete
 4/21/04 – Go-Live
 6/11/04 – End of Proof-of-Concept / Server Decommission

8.1 Effort to Complete

Based on the project schedule and delivery of educational roundtables, the total effort for the proof-of-concept was 700 hours. The effort is broken down into the following areas:

| Task | Effort | Resources |
|---|-----------|--|
| Educational Roundtables | 200 hours | Chief Technology Officer Director of Strategic Services Solution Architect |
| POC Envisioning | 25 hours | Project Manager Solution Architect |
| POC Planning | 75 hours | Project Manager Solution Architect |
| POC Developing | 250 hours | Project Manager Solution Architect Senior Technical Consultant |
| POC Stabilizing | 75 hours | Project Manager Senior Technical Consultant Quality Assurance |
| POC Deploying (includes demo presentation, project post-mortem & post-implementation support) | 100 hours | Project Manager Senior Technical Consultant |



Additionally, the participating agencies in this proof-of-concept estimate their development involvement as follow:

| Agency | Effort |
|-----------------------------|----------|
| Justice Information Network | 40 hours |
| Washington State Patrol | 40 hours |
| Pierce County LESA | 40 hours |
| King County RAIN | 40 hours |

9 Project Team Organization

9.1 Consultant Project Team

- Alain J. Dias – Project Manager
- Jon Lepeska – Senior Technical Architect & Solution Developer
- Alex West – Senior Technical Consultant
- Koray Ozcubukcu – Quality Assurance

9.2 Project Stakeholders

Since this is a proof of concept, project the stakeholders are limited to the following:

- JIN Program Director – Brian LeDuc
- JIN Technical Advisory Committee

9.3 Project Steering Committee Members

- Brian LeDuc – State of Washington Justice Information Network
- Dan Parsons – Washington State Patrol
- Charlotte Dazell – King County Sheriff's Office and RAIN liaison
- Mark Knutson – Pierce County LESA
- Cammy Webster – DIS